Cell & Tissue Research

Volume 297 1999

Editors

K. Unsicker, Heidelberg
(Coordinating Editor)
W.W. Franke, Heidelberg
A. Oksche, Giessen
B. Russell, Chicago
J.R. Sladek, North Chicago

Cooperating Editors

A.D. Blest, Canberra
Elisabetta Dejana, Milano
R. Dermietzel, Bochum
A.C. Enders, Davis
J.B. Furness, Melbourne
H.G. Hartwig, Düsseldorf
N. Hirokawa, Tokyo
A.F. Holstein, Hamburg
Brigitte M. Jockusch, Braunschweig
Chaya Kalcheim, Jerusalem
M. Kawata, Kyoto
R.O. Kelley, Chicago
H.-W. Korf, Frankfurt/M.
B. Krisch, Kiel
W. Kummer, Giessen
R.R. Markwald, Charleston
K. Miyazono, Tokyo
D.R. Nässel, Stockholm
R. Pabst, Hannover
J.M. Polak, London
F.G. Rathjen, Berlin
E. Reale, Hannover
J.-P. Revel, Pasadena
E.M. Rodríguez, Valdivia
D.R. Roop, Houston
D.W. Scheuermann, Antwerp
H. Schmalbruch, Copenhagen
G. Schütz, Heidelberg
Maya Simionescu, Bucharest
F. Sundler, Lund
Andrée Tixier-Vidal, Paris
Y. Toh, Fukuoka
L. Vollrath, Mainz
E.D. Wachsmuth, Basel
R.M. Zinkernagel, Zürich

Springer

Cell & Tissue Research

This journal was founded in 1924 as the Zeitschrift für Zellen- und Gewebelehre, from Vol. 2 (1925) it was published with the subtitle: Continuation of the Schultze-Waldeyer-Hertwig Archiv für mikroskopische Anatomie. Zeitschrift für Zellforschung und mikroskopische Anatomie (Vols. 1–20) (1934) as: Zeitschrift für wissenschaftliche Biologie (Abteilung B) edited by *R. Goldschmidt, W. von Möllendorff, H. Bauer, J. Seiler*. Vols. 2–28 (1938) edited by *R. Goldschmidt* and *W. von Möllendorff*. Vols. 29–33 (1944) as: Zeitschrift für Zellforschung und mikroskopische Anatomie, Abteilung A, Allgemeine Zellforschung und mikroskopische Anatomie, edited by *W. von Möllendorff* and *J. Seiler*, from Vol. 34 without the subtitle, Abteilung A, Allgemeine Zellforschung und mikroskopische Anatomie. From Vol. 34 (1949) edited by *W. Bargmann, J. Seiler*; from Vol. 53 (1960) edited by *W. Bargmann, B. Scharrer, J. Seiler*; from Vol. 83 (1967) edited by *W. Bargmann, D.S. Farner, A. Oksche, B. Scharrer, J. Seiler*; from Vol. 125 (1972) edited by *W. Bargmann, D.S. Farner, F. Knowles, A.Oksche, B. Scharrer*. Beginning with Vol. 125 (1972) with the subtitle Cell and Tissue Research, beginning with Vol.148 (1974) under the title Cell and Tissue Research and the subtitle Continuation of Zeitschrift für Zellforschung und mikroskopische Anatomie and beginning with Vol. 235 (1984) under the title Cell and Tissue Research. Beginning with Vol. 164 (1975), edited by *W. Bargmann, D.S. Farner, B. Lofts, A. Oksche, B. Scharrer* and *L. Vollrath*; as of Vol. 193 (1978), edited by *D.S. Farner, B. Lofts, A. Oksche* (Coordinating Editor), *B. Scharrer* and *L. Vollrath*; from Vol. 227 (1981), edited by *D.S. Farner, B. Lofts, J.F. Morris, A. Oksche* (Coordinating Editor), *B. Scharrer* and *L. Vollrath*; from Vol. 228 (1983), edited by *D.S. Farner, D.E. Kelly, B. Lofts, J.F. Morris, A. Oksche* (Coordinating Editor), *B. Scharrer* and *L. Vollrath*. Beginning with Vol. 235 (1984), title changed to Cell and Tissue Research (no subtitle). As of Vol. 251 (1988), edited by *H. Altner, D.S. Farner, B. Lofts, J.F. Morris, A. Oksche* (Coordinating Editor), *B. Scharrer, N.J. Strausfeld* and *L. Vollrath*. Beginning with Vol. 252/3 (1988), *M.J. Cavey* became one of the editors. From Vol. 254/1 (1988), edited by *H. Altner, M.J. Cavey, B. Lofts, J.F. Morris, A. Oksche* (Coordinating Editor), *B. Scharrer, N.J. Strausfeld* and *L. Vollrath*. Starting with Vol. 268/1 (1992), *J.R. Sladek* became one of the editors. As of Vol. 275/1 (1994) *B. Russell* became one of the editors. From Vol. 283/2 (1996), edited by *K. Unsicker* (Coordinating Editor), *H. Altner, M.J. Cavey, W.W. Franke, J.F. Morris, A. Oksche, B. Russell, J.R. Sladek, N.J. Strausfeld* and *L. Vollrath*. From Vol. 291/1 (1998), edited by *K. Unsicker* (Coordinating Editor), *M.J. Cavey, W.W. Franke, J.F. Morris, A. Oksche, B. Russell, J.R. Sladek, N.J. Strausfeld*.

Published: Vols. 1–33 (1924–1947) Julius Springer, Berlin, Vols. 34–35 (1948–1950) Springer, Wien, from Vol. 36 (1951) Springer, Berlin, Heidelberg.

Copyright

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Special regulations for photocopies in the USA: Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0302-766X, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

The Canada Institute for Scientific and Technical Information (CISTI) provides a comprehensive, world-wide document delivery service for all Springer-Verlag journals. For more information, or to place an order for a copyright-cleared Springer-Verlag document, please contact Client Assistant, Document Delivery, Canada Institute for Scientific and Technical Information, Ottawa, K1A OS2, Canada (Tel: 613-993-9251; FAX: 613-952-8243; e-mail: cisti.docdel@nrc.ca).

This journal is included in the ADONIS service.
In the ADONIS service copies of individual articles can be printed out from compact discs (CD-ROM) on demand. An explanatory leaflet giving further details of the scheme is available from the publishers on request.

Typesetters and Printers: Stürtz AG,Würzburg

© Springer-Verlag Berlin · Heidelberg 1999

Springer-Verlag GmbH & Co. KG
D-14197 Berlin, Germany
Printed in Germany

Contents of Volume 297

Akita K → Takeuchi M
Armour JA → Horackova M

Bardini M → Gröschel-Stewart U
Barnett NL → Pow DV
Baroni T → Locci P
Bayer L, Jacquemard C, Fellmann D, Griffond B: Survival of rat MCH (melanin-concentrating hormone) neurons in hypothalamus slice culture: histological, pharmacological and molecular studies 23
Beato A → Martín-Lacave I
Becchetti E → Locci P
Beier K → Orbea A
Bellows CG, Reimers SM, Heersche JNM: Expression of mRNAs for type-I collagen, bone sialoprotein, osteocalcin, and osteopontin at different stages of osteoblastic differentiation and their regulation by 1,25 dihydroxyvitamin D_3 249
Bernabé R → Martín-Lacave I
Bhatia R, Dube DK, Gaur A, Robertson DR, Lemanski SL, McLean MD, Lemanski LF: Expression of axolotl RNA-binding protein during development of the Mexican axolotl 283
Blijswijk B van → Cavaco JEB
Borhegyi NH, Molnár K, Csikós G, Sass M: Isolation and characterization of an apically sorted 41-kDa protein from the midgut of tobacco hornworm (*Manduca sexta*) 513
Böttner M, Suter-Crazzolara C, Schober A, Unsicker K: Expression of a novel member of the TGF-ß superfamily, growth/differentiation factor-15/macrophage-inhibiting cytokine-1 (GDF-15/MIC-1) in adult rat tissues 103
Burd GD → Petti MA
Burger I → Oland LA
Burnstock G → Gröschel-Stewart U
Byczko Z → Horackova M

Cajaraville MP → Orbea A
Calvitti M → Locci P
Carinci F → Locci P
Cavaco JEB, Blijswijk B van, Leatherland JF, Goos HJTh, Schulz RW: Androgen-induced changes in Leydig cell ultrastructure and steroidogenesis in juvenile African catfish, *Clarias gariepinus* 291
Christ B → Wilting J
Chun M-H → Oh S-J
Chung J-W → Oh S-J
Conde E → Martín-Lacave I
Cornett LE → Jaccoby S
Costa RH → Hromas R
Coulie B → Vanden Berghe P
Csikós G → Borhegyi NH

Dai J-, Gilbert LI: An in vitro analysis of ecdysteroid-elicited cell death in the prothoracic gland of *Manduca sexta* 319
De Liz S → Reuss S
Disque-Kaiser U → Reuss S
Dmitrovsky E → Hromas R
Donald JA → McLeod JL
Dube DK → Bhatia R

Ernsberger U, Rohrer H: Development of the cholinergic neurotransmitter phenotype in postganglionic sympathetic neurons 339

Fahimi HD → Orbea A
Fan Q → Liu M
Fellmann D → Bayer L
Fernández-Santos JM → Martín-Lacave I
Flik G → van der Heijden AJH
French AS → Torkkeli PH
Friauf E, Lohmann C: Development of auditory brainstem circuitry. Activity-dependent and activity-independent processes 187
Fujimoto T → Kogo H
Furness JB → Mann PT
Furukawa Y → Nagahama T

Gábriel R → Wilhelm M
Galera-Davidson H → Martín-Lacave I
Gaur A → Bhatia R
Gilbert LI → Dai J-
Goos HJTh → Cavaco JEB
Gotlieb AI → Lee T-YJ
Goto T → Kido MA
Granholm A-C → Henry S
Gressner AM → Mangasser-Stephan K
Griffond B → Bayer L
Gronenberg W, Schmitz H: Afferent projections of infrared-sensitive sensilla in the beetle *Melanophila acuminata* (Coleoptera: Buprestidae) 311
Gröschel-Stewart U, Bardini M, Robson T, Burnstock G: P2X receptors in the rat duodenal villus 111

Haller C → Kiessling F
Hansen U → Ioannidis N
Heersche JNM → Bellows CG
Henry S, Pfenninger KH, Mott JL, Granholm A-C: Anatomical distribution of glycoprotein 93 (gp93) on nerve fibers during rat brain development 67
Horackova M, Armour JA, Byczko Z: Distribution of intrinsic cardiac neurons in whole-mount guinea pig atria identified by multiple neurochemical coding. A confocal microscope study 409
Hromas R, Ye H, Spinella M, Dmitrovsky E, Xu D, Costa RH: Genesis, a Winged Helix transcriptional repressor, has embryonic expression limited to the neural crest, and stimulates proliferation in vitro in a neural development model 371
Huh W → Oh S-J
Humphrey PPA → Schindler M

Ide H, Itoh H, Yoshida E, Kobayashi T, Tomita M, Maruyama H, Osada Y, Nakahata T, Nawa Y: Immunohistochemical demonstration of inter-α-trypsin inhibitor light chain (bikunin) in human mast cells 149
Ikeda M → Takeuchi M
Ikegami H → Takeuchi M
Inoue K → Nishida T
Ioannidis N, Kurz B, Hansen U, Schünke M: Influence of fulvic acid on the collagen secretion of bovine chondrocytes in vitro 141
Itoh H → Ide H
Iwata T → Nishida T
Iyama K-i → Sugahara K
Izumi S → Kishimoto A

Jaccoby S, Koike TI, Cornett LE: *c-fos* Expression in the forebrain and brainstem of White Leghorn hens following osmotic and cardiovascular challenges 229
Jacquemard C → Bayer L
Janssens J → Vanden Berghe P

Kaneda K → Nishida T
Kartenbeck J → Kiessling F
Kato T → Nishida T
Kawano T → Nagahama T
Kido MA, Yamaza T, Goto T, Tanaka T: Immunocytochemical localization of substance P neurokinin-1 receptors in rat gingival tissue 213
Kiessling F, Kartenbeck J, Haller C: Cell-cell contacts in the human cell line ECV304 exhibit both endothelial and epithelial characteristics 131
Kim H-I → Oh S-J
Kim I-B → Oh S-J
Kim K-Y → Oh S-J
Kinoshita H → Nishida T
Kishimoto A, Nakato H, Izumi S, Tomino S: Biosynthesis of major plasma proteins in the primary culture of fat body cells from the silkworm, *Bombyx mori* 329
Kloas W → Maake C
Kobayashi T → Ide H
Kogo H, Fujimoto T, Mori T: Evidence for gonadotropin-releasing hormone receptor mRNA expression by estrogen in rat granulosa cells 459
Koike TI → Jaccoby S
Kurimoto M → Takeuchi M
Kurisu K → Onishi T
Kurz B → Ioannidis N

Leatherland JF → Cavaco JEB
Lee T-YJ, Gotlieb AI: Early stages of endothelial wound repair: conversion of quiescent to migrating endothelial cells involves tyrosine phosphorylation and actin microfilament reorganization 435
Lemanski LF → Bhatia R
Lemanski SL → Bhatia R
Lilli C → Locci P
Lim I → McCormick J
Liu M, Warn JD, Fan Q, Smith PG: Relationships between nerves and myofibroblasts during cutaneous wound healing in the developing rat 423
Locci P, Baroni T, Pezzetti F, Lilli C, Marinucci L, Martinese D, Becchetti E, Calvitti M, Carinci F: Differential in vitro phenotype pattern, transforming growth factor-β_1 activity and mRNA expression of transforming growth factor-β_1 in Apert osteoblasts 475
Lohmann C → Friauf E

3 558HI XL 1810 ICI
11/99 31249-200 NULE

Maake C, Kloas W, Szendefi M, Reinecke M: Neurohormonal peptides, serotonin, and nitric oxide synthase in the enteric nervous system and endocrine cells of the gastrointestinal tract of neotenic and thyroid hormone-treated axolotls (*Ambystoma mexicanum*) 91
Maeda T → Onishi T
Mangasser-Stephan K, Gressner AM: Molecular and functional aspects of latent transforming growth factor-β binding protein: just a masking protein? 363
Mann PT, Furness JB, Southwell BR: Choline acetyltransferase immunoreactivity of putative intrinsic primary afferent neurons in the rat ileum 241
Marinucci L → Locci P
Marrero HG → Oland LA
Martinese D → Locci P
Martín-Lacave I, Bernabé R, Sampedro C, Conde E, Fernández-Santos JM, San Martín MV, Beato A, Galera-Davidson H: Correlation between gender and spontaneous C-cell tumors in the thyroid gland of the Wistar rat 451
Maruyama H → Ide H
Matheson SF → Petti MA
Matsushima O → Nagahama T
Mawe GM → Vanden Berghe P
McCormick J, Lim I, Nichols R: Neuropeptide precursor processing detected by triple immunolabeling 197
McLean MD → Bhatia R
McLeod JL, Donald JA: Relationship between arginine vasotocin-like and natriuretic peptide-like immunoreactive structures in the brain of the toad *Bufo marinus* 47
Millam JR → Wang R
Minakata H → Nagahama T
Molnár K → Borhegyi NH
Mori T → Kogo H
Mori T → Takeuchi M
Morishita F → Nagahama T
Mott JL → Henry S

Nagahama T, Ukena K, Oumi T, Morishita F, Furukawa Y, Matsushima O, Satake H, Takuwa K, Kawano T, Minakata H, Nomoto K: Localization of leech excitatory peptide, a member of the GGNG peptides, in the central nervous system of a leech (*Whitmania pigra*) by immunohistochemistry and in situ hybridization 155
Nakahata T → Ide H
Nakato H → Kishimoto A
Nawa Y → Ide H
Neeff H → Wilting J
Nichols R → McCormick J
Nishida T, Inoue K, Kato T, Iwata T, Kinoshita H, Kaneda K: Localization and ultrastructure of pulmonary dendritic cells during delayed-type hypersensitivity reactions in mice 485
Nomoto K → Nagahama T

Oh S-J, Kim H-I, Kim I-B, Kim K-Y, Huh W, Chung J-W, Chun M-H: Morphology and synaptic connectivity of nitric oxide synthase-immunoreactive neurons in the guinea pig retina 397
Ohshima H, Wartiovaara J, Thesleff I: Developmental regulation and ultrastructure of glycogen deposits during murine tooth morphogenesis 271
Ohta T → Takeuchi M
Okura T → Takeuchi M
Oland LA, Marrero HG, Burger I: Glial cells in the developing and adult olfactory lobe of the moth *Manduca sexta* 527
Onishi T, Ooshima T, Sobue S, Tabata MJ, Maeda T, Kurisu K, Wakaisaka S: Immunohistochemical localization of calbindin D28k during root formation of rat molar teeth 503
Ooshima T → Onishi T
Orbea A, Beier K, Völkl A, Fahimi HD, Cajaraville MP: Ultrastructural, immunocytochemical and morphometric characterization of liver peroxisomes in gray mullet, *Mugil cephalus* 493
Osada Y → Ide H
Oumi T → Nagahama T

Panzica GC → Verzé L
Paraninfo A → Verzé L
Petti MA, Matheson SF, Burd GD: Differential antigen expression during metamorphosis in the tripartite olfactory system of the African clawed frog, *Xenopus laevis* 383
Pezzetti F → Locci P
Pfenninger KH → Henry S
Pow DV, Barnett NL: Changing patterns of spatial buffering of glutamate in developing rat retinae are mediated by the Müller cell glutamate transporter GLAST 57
Prokop A: Integrating bits and pieces: synapse structure and formation in *Drosophila* embryos 169

Ramieri G → Verzé L
Reimers SM → Bellows CG
Reinecke M → Maake C
Reuss S, Disque-Kaiser U, De Liz S, Ruffer M, Riemann R: Immunofluorescence study of neuropeptides in identified neurons of the rat auditory superior olivary complex 13
Riemann R → Reuss S
Robertson DR → Bhatia R
Robson T → Gröschel-Stewart U
Rohrer H → Ernsberger U
Ruffer M → Reuss S

Sadohara T → Sugahara K
Sampedro C → Martín-Lacave I
San Martín MV → Martín-Lacave I
Sass M → Borhegyi NH
Satake H → Nagahama T
Schemann M → Vanden Berghe P
Schindler M, Humphrey PPA: Differential distribution of somatostatin sst_2 receptor splice variants in rat gastric mucosa 163
Schmitz H → Gronenberg W
Schober A → Böttner M
Schulz RW → Cavaco JEB
Schünke M → Ioannidis N
Smith PG → Liu M
Sobue S → Onishi T
Southwell BR → Mann PT
Spinella M → Hromas R
Sugahara K, Sadohara T, Sugita M, Iyama K-i, Takiguchi M: Differential expression of CCAAT enhancer binding protein family in rat alveolar epithelial cell proliferation and in acute lung injury 261
Sugita M → Sugahara K
Suter-Crazzolara C → Böttner M
Szendefi M → Maake C

Tabata MJ → Onishi T
Tack J → Vanden Berghe P
Takeuchi M, Okura T, Mori T, Akita K, Ohta T, Ikeda M, Ikegami H, Kurimoto M: Intracellular production of interleukin-18 in human epithelial-like cell lines is enhanced by hyperosmotic stress in vitro 467
Takiguchi M → Sugahara K
Takuwa K → Nagahama T
Tanaka T → Kido MA
Thesleff I → Ohshima H
Tomino S → Kishimoto A
Tomita M → Ide H
Torkkeli PH, French AS: Primary culture of antennal mechanoreceptor neurons of *Manduca sexta* 301

Ukena K → Nagahama T
Unsicker K → Böttner M

van der Heijden AJH, van der Meij JCA, Flik G, Wendelaar Bonga SE: Ultrastructure and distribution dynamics of chloride cells in tilapia larvae in fresh water and sea water 119
van der Meij JCA → van der Heijden AJH
Vanden Berghe P, Coulie B, Tack J, Mawe GM, Schemann M, Janssens J: Neurochemical coding of myenteric neurons in the guinea-pig antrum 81
Verzé L, Paraninfo A, Ramieri G, Viglietti-Panzica C, Panzica GC: Immunocytochemical evidence of plasticity in the nervous structures of the rat lower lip 203
Viglietti-Panzica C → Verzé L
Völkl A → Orbea A

Wakaisaka S → Onishi T
Wang R, Millam JR: Corticotropin-releasing hormone-immunopositive nerve elements in apposition to chicken gonadotropin-releasing hormone I-containing perikarya in Japanese quail (*Coturnix coturnix japonica*) brain 223
Warn JD → Liu M
Wartiovaara J → Ohshima H
Wendelaar Bonga SE → van der Heijden AJH
Wilhelm M, Gábriel R: Functional anatomy of the photoreceptor and second-order cell mosaics in the retina of *Xenopus laevis* 35
Wilting J, Neeff H, Christ B: Embryonic lymphangiogenesis 1

Xu D → Hromas R

Yamaza T → Kido MA
Ye H → Hromas R
Yoshida E → Ide H

Cell and Tissue Research announces Online First publication (Editorial) 337

Indexed in *Current Contents, Index Medicus,* and *EMBASE*